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ACROSS THE BOLIVIAN HIGHLANDS FROM COCHABAMBA TO THE CHAPARÉ

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Leaving the enterprising city of Cochabamba on the afternoon of May 9, 1915, we rode eastward fifteen miles on the first part of our journey to the Amazon Basin, arriving at the town of Sacaba by nightfall. The intervening country is thickly settled, and large areas are irrigated and planted in alfalfa, maize, wheat, grapes, and vegetables. Nearly all the inhabitants are Quechua Indians. Numerous little canals carry water from a brook along the adjacent mountain side, and the country is dotted with small stone huts surrounded by carefully cultivated fields. The rivulet never dries, but on the contrary supplies a constant stream of water of sufficient volume to irrigate a large area. The canals have been dug with great precision; each family uses only as much water as is required, and at stated intervals, so that there is enough for all. The trail goes up steadily until an elevation of 12,000 feet is reached. As we neared the summit of the ridge, a strong wind sprang up so that it was difficult to keep one's place in the saddle.

Beyond the first ridge lies the high mountain valley in which is located the Quechua village of Cuchicancha ("pig-pen"). There are several score of huts scattered about in little groups, built of stone and having thatched roofs. The Indians speak practically no Spanish and live in much the same way as they did in the days of Atahualpa. In order to cultivate the land they have gathered the stones, which everywhere cover the ground, into huge piles, and have also built fences of them; large quantities of potatoes, okas, and avas are grown. Each family owns a flock of sheep, which apparently replaces the llama of olden days, although herds of the latter animal are still frequently to be seen; they also keep a few pigs and burros and have taken to cultivating wheat, oats, and rye.

The Indians were friendly and brought us eggs, goats' milk, chickens, and bread. Each morning the children took the flocks to the narrow river bed to feed on the sparse vegetation, and at night they brought them back to the stone corrals; they carried a few boiled potatoes with them for luncheon and also their spinning for pastime. All spin except the men; and everyone had an abundance of blankets and ponchos; even the bags for grain and potatoes are made of home-spun wool. The harvest had been gathered and everyone seemed contented. One day a party of Indians collected to thresh wheat; from a distance I could hear the boom of a drum and the shrill wail of reed flutes; as I approached, a strange sight met my

eyes. Bundles of grain had been built into a high mound on the top of which sat the musicians; a dozen mounted Indians were driving a herd of mules and burros around the base. Round and round they went at a frantic pace, keeping perfect time with the music; as the animals circled the stack, a man on top cast armfuls of wheat down in their path, so that in running over it repeatedly they naturally trampled out the grain. About a hundred men, holding on to a long rope, formed a circular fence around the racing mob and prevented any of the animals from escaping. This was their method of threshing.

We were surprised at the abundance of life in this naturally barren region. There were practically no indigenous trees, but a long line of willows had been planted near one of the houses, and to these thousands of cowbirds, pigeons, and finches came every night to sleep. A short walk across the stubble fields always revealed something new. There were tinamous which rose with a loud whir that reminded one of partridges; many species of brownish birds belonging to the wood-hewer family, one of them with a long, curved bill, but running about on the ground or perched on the stone fences; large flickers lived among the rocks, and condors soared above; even flocks of gulls and plovers made this barren highland their home. The most unusual birds were two species of very small parrakeets which clambered over the rocks and slept in holes in the high banks. Vast numbers of cavies lived in the rock piles, from which they sallied at all hours of the day in quest of food; and many small rodents inhabited the grain fields.

A good trail leads eastward from Cuchicancha; the summit of the range rises about two leagues from the settlement. At the time of our visit the black, rocky peaks were covered with a mantle of snow, and an icy wind swept through the cleft which serves as a pass. The elevation of the trail is 13,400 feet. At the base of the towering masses which rise several hundred feet above the passage lies a placid little lake, and ducks and gulls were swimming on its peaceful surface. Condors swept down from above to inspect us, and then soared back to their perches among the unscalable crags. On the eastern side of the divide the trail leads downward abruptly, and the character of the country changes; at 11,000 feet a sparse growth of bushes appears, growing denser with each passing mile. Suddenly we found ourselves on the rim of a gorge through which the Incachaca River rushes—a raging mountain torrent fed by melting snows. The path was a mere shelf cut in the face of the cliff; to the left rose the smooth walls of black, frowning rock; to the right was a sheer drop to the river. We could peer over the edge of the precipice and, looking down two thousand feet, see drifting clouds that filled the chasm and shut from view the bottom hundreds of feet below.

At 7,700 feet the forest begins; a collection of half a dozen huts, called Incachaca, nestles in its inner border, and there we decided to remain for a



FIG. 1.



FIG. 2.

FIG. 1—Bringing the flocks home just before sundown, in the beautiful country near Cochabamba.
FIG. 2—Quechua Indians threshing wheat at Cuchicancha.

few weeks. We secured quarters in a large house belonging to a company engaged in digging a canal on the opposite side of the gorge; when this work is completed the water of the river will be turned into the canal and used to furnish electricity for the light and street car service of Cochabamba. A power house had been constructed at the bottom of the ravine, and cables for transmitting the current were strung across the mountains. At Incachaca the river flows through an underground channel; while exploring the forest one day we came suddenly upon a narrow cleft in the mountain side, scarcely a dozen feet across, and with a great deal of effort were finally able to distinguish the roaring, white torrent a hundred feet below. The edges of the cleft are so overgrown with ferns that one has no idea of its existence until the very brink is reached. A short distance below, the river emerges from the darkened caverns, and, plunging over the face of a precipice, thunders into a pool in a sheer drop of fifty or sixty feet.

We found the upper limit of a subtropical fauna at Incachaca. Bird flocks traveled hurriedly through the trees; they were composed of bright-colored tanagers, finches, and cotingas. Honey-creepers and hummers were plentiful in the flowering shrubs. Queer little ducks (*Merganetta*) disported in the pool below the falls, and dippers ran nimbly along the edge of the water. In one of the tall trees near the river we discovered the nest of an eagle. We found it impossible to climb the tree, but a German named Ricardo Marquardt, who was in charge of the workmen along the river, succeeded in reaching the huge mass of sticks seventy feet above the ground and brought down a beautifully spotted egg. To my companion, Mr. Howarth S. Boyle, who accompanied me on the entire trip, belongs the credit of taking the rarest birds from this locality; they were a pair of white-eared thrushes (*Entomodestes*), specimens of which, so far as I can learn, are found in only two other museums. In the lower growth lived many ant-thrushes (*Grallaria*), whose clear call could be heard at all hours of the day. This is one of the hardest of all birds to collect. The long-legged, tailless songsters never leave the thick growth of ferns and brush, and the only way to secure them is to enter the dense cover, sit quietly, and imitate the clear, ringing call in the hope of attracting one of them; sometimes this requires hours of patient work, and more often than not the effort is futile. Coatimondis, or raccoons, roamed in the woods in small bands, sniffing in the damp mould and searching for insects; while feeding they uttered deep grunts, but when frightened they gave a succession of rapid birdlike chirps. These animals spend a good deal of their time in the trees, but are almost invariably found on the ground in the day time; when pursued they are very pugnacious, and it takes an exceptionally agile dog indeed to avoid being severely torn by their sharp teeth and claws. In captivity they become very tame, although their mischievous disposition often gets them into trouble.

From Incachaca to Locotal is a distance of only eight miles; and the

scenery along a part of the route is magnificent. The bare, shattered, and split crags reach many hundred feet above the trail, and some even stand in a leaning position so that the tops actually hang over the narrow passageway as if threatening to topple down at any moment; below, the steep slope is covered with huge boulders which have fallen from the towering masses above. At Locotal there are but half a dozen houses, occupied by Quechua families who subsist mainly on the profits derived from the sale of *chicha*. We stopped a few days in a hut owned by a kind-hearted old woman who gave us permission to use it; next day we found that we were occupying the school-room, and the teacher, followed by his half dozen ragged scholars, came to take possession, but he declared a vacation until the *gringos* should move on.

The forest at Locotal is somewhat taller than at Incachaca, but the birds are of a similar character. Very abundant and beautiful were the brilliant cocks-of-the-rock; the bright, orange-red creatures flashed through the deep green of the forest like fiery comets and, perching on the low branch of a tree, quietly surveyed their surroundings or uttered hoarse, croaking calls. This bird is most conspicuous in its natural environment. Among the other large birds were green toucans (*Aulacorhynchus*), which the natives hunted on every possible occasion for the sake of obtaining the bill. This they use as *remedio*, the rasping sound made by rubbing the mandibles together being supposed to be a sure cure for epilepsy.

While we were pursuing our work at Locotal, a man named Quiroga chanced to pass and begged that we pay him the honor of stopping at his house some distance below; it was a charming place, he said, in the very heart of the wonderful *yungas*. We gladly accepted his invitation and one morning loaded our outfit on mules and started down the trail. For a mile there is only a narrow ledge in the face of a rounded mountain of dark sandstone; a few stunted sprouts and myriads of orchids covered with purple blooms have secured a precarious foothold in crevices in the glazed surface; hundreds of feet below, but invisible, the river tears through a narrow gorge.

Miguelito is only three miles below Locotal and consists of three or four huts in the center of a grassy clearing. The Quechuas who live there are friendly, and one may be sure of a welcome for a night's stop. At 5,500 feet the forest becomes taller and the trees attain a greater diameter. The vegetation of the subtropic zone reaches its highest development at this altitude. After crossing a ridge 6,700 feet high, the trail descends a long slope into the *yungas*, properly known as the *yungas* of Cochabamba. At the base of the ridge, and shortly before entering the cultivated area, we crossed the dry, narrow bed of a stream which was filled with rocks bearing the imprints of leaves, and also fossil shells.

Yungas is the name given to the fertile mountain slopes which have been cleared of forest and cultivated. When we visited the region, in June, only

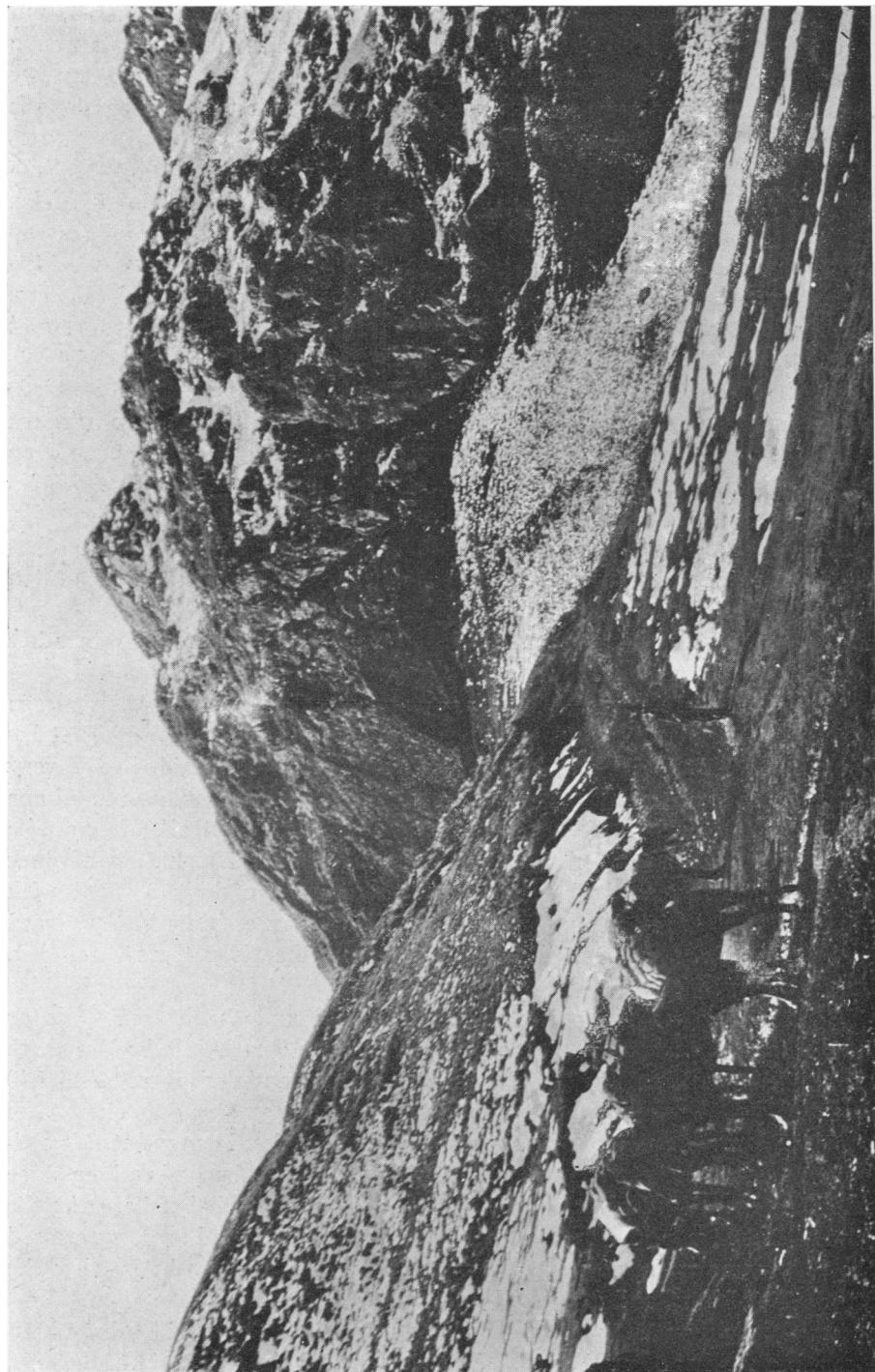


FIG. 3—Pass at Cuchicancha.

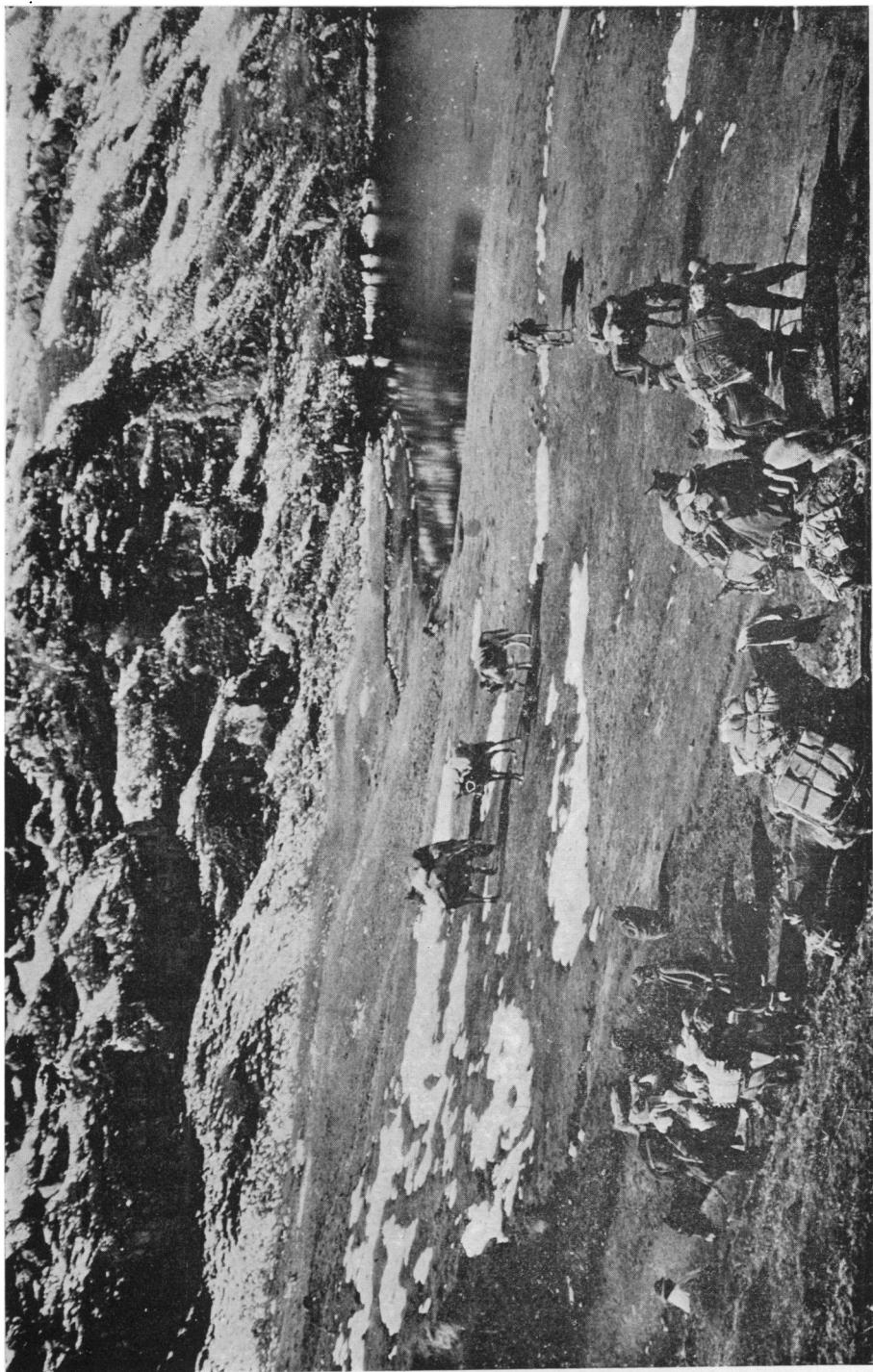


FIG. 4—Tightening the packs at the base of the pass, beyond Cuchicancha.

the Indian caretakers lived in the habitations, the coca, which is the principal product, having been collected a short time before and the *proprietarios* having gone back to Cochabamba. The owners visit their plantations three times a year, supervise the gathering and packing of the leaves and, after a month, return to Cochabamba to sell the drug and live on the proceeds until the next harvest.

After spending an hour in questioning the occupants of the various houses that we passed, we succeeded in locating the hut to which we had been invited. It was a low, one-room, board structure, open at both ends and having wide entrances on each side, situated in the center of a large banana field. An Indian, so old that he could hardly walk, lived in the hovel and refused to admit us; however, we flourished our letter of introduction from the owner of the premises, took possession without very much trouble, and remained a week. The climate at this season, June, is most trying. Although the elevation is only 3,500 feet, the whole region was covered with fog every night, and the cold and damp penetrated everything; during a part of the year the weather is good, and then life in the *yungas* is more tolerable.

The fauna of the country seems to represent a transition zone. There are birds typical of the higher country, and others which are common lower down; also, a number found at approximately this altitude only. Near the house, and on the edge of the banana plantation, was a tall, isolated tree. Flocks of birds in their flight from one side of the canyon to the other would invariably alight in its branches for a few minutes. There were many brilliantly colored little tanagers (*Tanagra*) which came to the tree in considerable numbers and chirped and quarreled as they flitted about examining the leaves for insects, or reached out to pick the small fruits with which the tree was covered; one day not less than seven species of these birds visited this resort within a short time. Giant orioles (*Ostinops*) were also very plentiful, and traveled in large, noisy flocks. One of the more interesting birds was a species of small, red-tailed parrakeet (*Pyrrhura*) which clung to and crawled up the sides of trees like wood-hewers; it was almost impossible to see them unless they moved, so well did their coloration conceal them.

There is no flat valley along the river, which is of considerable size, and all cultivation is done on the steep mountain sides. Coca is planted in terraces and occupies the greatest acreage; there are also red bananas, plantains, guavas, and sugar cane. Numerous huts of flimsy construction are scattered along the entire twenty miles or more of cultivated slopes; each has a fenced-in area paved with flat stones upon which coca leaves are dried. We stopped at a number of these dwellings in an attempt to buy fruit or vegetables, but unfortunately the men were all away working in the fields, and anyone who has attempted to purchase anything from the average Quechua squaw knows how hopeless a task it is. Although they may have a super-

abundance of the article desired, they seem to take great delight in refusing to sell anything to a stranger. In such cases the only method to follow is to take what is needed, pay a fair price for it, and pass on, leaving them in the midst of their wild rantings. The men are easier to deal with. The peons, and the patron as well, stopped at each hut where the white flag announced that *chicha* was for sale, and attempted to drink enough to last them until the return; after their money gave out they left articles of clothing in payment for the drinks. It was therefore a great relief when the last abode of the intoxicating beverage had been left behind, and we plunged into the wilder-



FIG. 5—Town and valley of Cuchicancha in the Eastern Andes of Bolivia.

ness. Immediately after leaving the *yungas* we ascended a precipitous slope, the top of which was 700 feet above the surrounding country; and then descended on the other side until the elevation was only 2,000 feet; here the forest was more tropical in character, and some of the trees, especially the cottonwoods, reached a height of 150 feet and measured 25 feet through the buttressed roots at the base.

The day after leaving the *yungas* we reached the most dangerous part of the whole trail. After crossing a number of steep, high ridges, we came to an abrupt slope seared by a huge gash where the treacherous white clay slides constantly into the river, many hundreds of feet below. Each caravan desiring to pass must first cut a ledge in the moving mass of soft, muddy earth, and then hurriedly lead the mules across, one at a time, before

the newly-made trail is obliterated. The spot is very appropriately named *Sal si Puedes* (pass if you can).

That night we made camp early on the banks of the Rio San Antonio, called "Chusipascana" by the Indians, which means Mosquito River. The altitude of the site is only 1,800 feet above sea level. The river was a clear, rapid stream one hundred feet wide, flowing through a rock bed a quarter of a mile across. Swarms of black flies, sand-flies, and other stinging or biting insects immediately came out to greet us. Birds were very abundant. In addition to the jays, ant-wrens, and manakins which remained in the forest, flocks of parrots and toucans flew across the open spaces. An unusual occurrence was the great flocks of a new species of giant oriole; there were not less than a thousand of these birds in a single flock, and they roamed almost everywhere, coming close to camp to inspect the tents and to discuss them in hoarse cries of curiosity or resentment. They were beautiful creatures, of a deep chestnut color with light olive-green head and neck; the face is devoid of plumage and is flesh-colored, while the tip of the bill is deep orange. The flesh is highly esteemed by the natives. As soon as the cargoes were neatly placed in a pile and covered with a tarpaulin to keep them dry, the peons cooked their supper; this consisted of a thick soup made of corn meal and *charque* (dried beef). They had a meal in the morning and another at night; during the long walk throughout the day they chewed coca leaves. The mules were turned loose to shift for themselves, but, as plenty of wild cane grows near the rivers, they had an abundance of food.

The remainder of the journey was through the heavily forested lowland; the last of the mountain ridges had been left behind. During the dry season caravans follow the courses of streams as much as possible. The water is low and the wide, rocky margins serve as roads. This is far from being easy on the mules; the animals go stumbling and slipping along, but a good many miles are cut from the total length of the journey. Streams are encountered with frequency and as one penetrates farther into the interior they become wider and deeper. We crossed not less than six fords in a single day, all between two hundred and three hundred feet wide, the water averaging from three to four feet deep. Although the current is strong, the mules are accustomed to this kind of work and usually manage to cross safely, often stopping unconcernedly in the deepest, swiftest spot to take a drink. Occasionally, however, one of the animals slips on a moss-covered boulder and falls; then it is a difficult matter to assist the drowning creature to his feet, as the swift water may roll him over and the weight of the pack keep him down.

Wild animals are particularly abundant in this section of the country. All day long we could hear the raucous scream of long-tailed, multi-colored macaws (*Ara*) as they flew two by two overhead. Many hawks sat alert on dead snags near the water, and black and white gulls flapped silently

up and down the river. Occasionally we caught a glimpse of a small flock of muscovies, the largest of South American ducks, as the great, black birds flew heavily upstream. There were also guans, resembling small turkeys, which sat quietly in the tops of tall trees until we approached quite near to them; then, emitting a loud, mulelike bray, they set their wings and soared across the river or down into the underbrush. At night the forest was usually quiet, reminding one of "Pools of Silence." Occasionally, however, the still air was suddenly rent by the most unearthly noise that mortal man ever heard, and the woods rang with the wild, insane cackle of forest rails (*Aramides*). Beginning with a shrill *oohoo-hee-cra* the demoniacal chorus would continue several minutes without interruption, finally ending with a few low, explosive *cow-cow-cows*. A number of birds always sang together, and the first time one hears the performance it is enough to make the flesh creep and the hair stand on end; and even after one becomes somewhat accustomed to the noise it fails to be conducive to peaceful slumber. Night monkeys (*Douroucouli*) were apparently plentiful, but we never saw them in the daytime. After darkness had fallen they began to move about in the tree-tops; on one occasion a troop selected the tree under which we camped for the scene of their frolic, and kept us awake the greater part of the night. They dropped leaves and twigs down upon the tent-fly, probably through accident, but perhaps prompted by the desire to find out if anything would happen. At frequent intervals they drew together in a close group to chatter in low, grunting tones, and then, apparently coming to the conclusion that the queer-looking objects below them must be capable of some interesting action, again tempted fate by showering down more twigs and leaves.

In many places the receding water of the river had left isolated pools; these were teeming with fish of many species, some of which were of large size; a number we caught had practically the entire tails and fins eaten off, their cannibalistic brethren having no doubt taken advantage of the circumstances and begun to devour them piecemeal at their leisure. The trees were tall and straight, and there was dense undergrowth near the rivers only. Mosses and epiphytes, so typical of the subtropical zone, were almost lacking; but frequently the wind brought the delightful fragrance of ripening vanilla beans and the perfume of flowers. Great clusters of scarlet trumpet-flowers dangled from the tips of slender vines, and from the tops of many of the trees drooped long garlands of huge white and blue flowers that resembled sweet peas; some of these blooms were two inches in diameter. There were also clumps of terrestrial orchids on some of the rocks, with slender spikes of deep purple flowers waving daintily under the impulse of each passing breeze.

Seven days after leaving Cochabamba, we came suddenly upon the little cluster of grass and bamboo houses known as Todos Santos; there were exactly eight of them, two of which were of large size, partially enclosing

a wide plot of ground carpeted with soft, green grass; tall forest hemmed in the settlement on three sides, and the Rio Chaparé, flowing through deep banks, formed the boundary on the fourth side. The largest building was occupied by the *intendente*, or Federal agent, who generously provided us with accommodations; in addition to the several living rooms, there was an immense ware-room stored with hides, salt, and other articles of commerce. The other houses were occupied by families of Bolivians who



FIG. 6.



FIG. 7.

FIG. 6—The moss-draped forest of the subtropical zone in the *yungas* of Cochabamba.

FIG. 7—Quechua hut in the *yungas*.

possessed land or concessions in the neighborhood and owned numbers of Indians of the Yuracaré tribe; these latter lived in long sheds built in the rear of the dwellings of the people they served. There was also a small church, but no shops of any description. In spite of its inconsiderable size, Todos Santos is a place of importance because it serves as an outlet for commerce from Cochabamba, and Bolivia in general, and is the port of entrance for hides from Trinidad, and merchandise entering by way of the Amazon and Madeira-Mamoré Railroad. A small steamer, the *Ana Kata-rina*, was tied up against the bank waiting for the water to rise sufficiently for her to proceed down the river; this boat plies more or less regularly between Todos Santos and Trinidad, and requires three days for the downward trip, and five days coming up. From Cochabamba to Trinidad is a distance of approximately 265 miles, 165 overland, and an additional 100

on the river. During the dry season, steam navigation on the Chaparé is very irregular, but canoes of large size and native paddlers may always be had. During the rainy season there is a small steamer or launch every fortnight.

Several years before, the Government had, by law, abolished the practice of keeping Indians in a condition of semi-slavery and had ordered all owners to turn them over to the missions; this, however, had not been done,



FIG. 8.

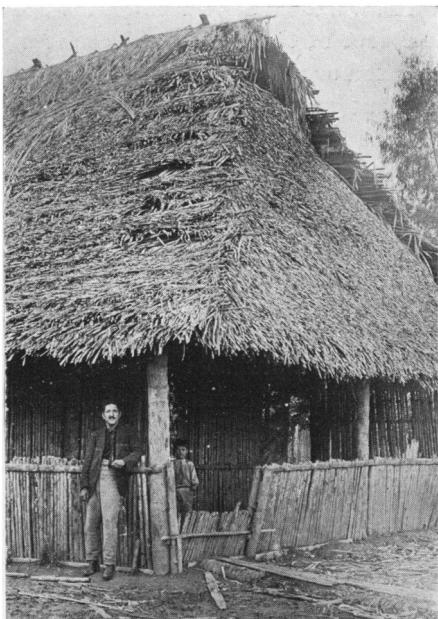


FIG. 9.

FIG. 8—A crude shelter of stones and brush erected by Quechua Indians in a river bed. A white flag waving overhead announces that *chicha*, an intoxicating beverage, is for sale within.

FIG. 9—The principal building in Todos Santos.

and each Bolivian family living at Todos Santos had a number of Yuracarés in its service. Not far from the settlement were a number of clearings, some of considerable size, where fruits and vegetables were cultivated for the benefit of the *amos*, as the owners of Indians are called; the Indians cleared the ground, cultivated it, and then brought in the results of their labor, receiving nothing in return. They seemed fairly contented, however, and did not appear to be suffering from ill-treatment. They frequently spent days at a time in their shelters on the edges of the fields, or on hunting and fishing trips far from their homes.

Every Yuracaré woman kept a number of Amazon parrots which she looked after carefully and refused to sell, even at a good price. Upon asking the reason for this I was told that they rear them for the sake of the tail-

feathers, which are in great demand by the Aymarás. A parrot will grow three crops of feathers a year, each of which is worth fifty *centavos*. The Aymarás from the vicinity of La Paz send down agents at regular intervals to purchase these feathers, as they use them in making ornaments worn during their annual festivals. In the branches of one of the tall trees near the village a neat little hut, resembling a Philippine tree-dwelling, had been built of bamboo and leaves. Indians armed with bows and arrows concealed themselves in this house, forty feet above the ground, and shot many of the birds which came to feed on the growing fruit; other Indians, hidden about the base of the tree, watched the birds as they fell, gathered them up, and skinned or plucked them. In this way quite a number could be shot without alarming a feeding flock.

The forest around Todos Santos abounds in wild life. Squirrel-monkeys (*Saimiri*) are very numerous and travel in troops of from twenty to fifty individuals; we saw them daily, playing in the trees, and feeding on fruits, buds, and insects. They are delightful little pets, and one that we owned spent the greater part of the day catching the mosquitoes which infested our habitation. It searched every nook and crevice for insects, and one of its chief pastimes was to look through a pack of cards in the hope of finding mosquitoes between them. Harpy-eagles also are very plentiful and feed on the squirrel-monkeys to a great extent, as they are easy to catch. However, monkeys are not the only animals which suffer; we one day found the remains of a sloth that had been dropped by an eagle; the entire forepart had been eaten away.

There were numerous trees covered with vivid, scarlet blossoms, scattered throughout the forest and forming gaudy little islands of color which stood out very conspicuously amid the green tree-tops. These trees are known as *madre de cacao* because they are frequently planted in cacao groves to shield the young plants from the sun. The flowers contain so much nectar that numbers of birds feed upon them, including parrots, macaws, and orioles; when the brilliant blooms fall into the river they are greedily snapped up by fish.

Of small birds there was such a variety that it would be impossible to mention all of them; but one in particular deserves attention: it is a species of manakin called "child of the sun" by the Yuracarés, who look upon the tiny creature with reverence and do not harm it under any circumstances. The bird is not as large as a sparrow, but is of stocky build, with a bright orange-red head and neck, the remainder of the body being black. As it whirs from branch to branch it makes a loud sputtering, crackling noise which reminds one of a bunch of small, exploding fire-crackers. The female of the species is of a dull green color.

At Todos Santos, as elsewhere, local migrations of birds in the heart of the tropics were several times forcibly brought to our attention. We had been hunting in the forest a number of weeks and were pretty well

acquainted with its inhabitants; suddenly a species entirely new to us appeared in great abundance in all parts of the region; each member of the expedition, including the native assistants, brought in specimens of it the same day. This can be explained only by the fact that flocks of these particular birds had arrived suddenly from some distant part, probably attracted by a fruit or insect which chanced to be plentiful at the time, and upon which they fed.

Several miles from port and entirely concealed by the forest, stretches a lagoon of considerable size; it is connected with the Chaparé by a small, brush-clogged creek, but the water is stagnant and filled with decaying vegetation and detritus. Masses of bushes and swamp grass grow all along the borders, and in some sections the surface of the water is covered with floating, aquatic plants. As may be supposed, many species of birds live both about the water and in the dense thickets that line the banks. Among the former was the rare little sun grebe, but it was by no means abundant; the few solitary individuals we saw were always surprised out in the open water, and, after giving a series of hoarse, loud cries either flew or swam as rapidly as possible to the nearest clump of vegetation that offered a secure retreat. Graceful jacanas stepped about daintily on the lily-pads; their toes are very long and give the feet a wide spread, thus enabling the birds to walk on the floating little islands of water hyacinths and wild lettuce; for this reason the natives call them *pájaros de Jesú Cristo*, because they can walk on the water. Several species of flycatchers and large, noisy wrens (*Donacobia*) lived in the partly submerged bushes; we found several of the bulky, domed grass nests of the former, but it was almost invariably impossible to reach them, as they always harbored colonies of biting ants which rushed out in maddened frenzy when the nest was touched; however, the birds and ants seemed to live in perfect harmony. In the tangles of tall bamboo growing on the bank and drooping out over the water, lived flocks of hoatzins, and numbers of several species of dendrocolaptine birds or wood-hewers; also an occasional water turkey and cormorant. Many black and white ibises soared above in circles and at a great height; they acted not unlike vultures, but the long, outstretched neck and legs immediately gave a clue to their identity.

The forest was full of surprises; one morning my companion encountered a tamandua ant-eater which was on the ground and refused to realize that the close proximity of man meant danger; my companion was but lightly armed and shot the tough, thick-skinned animal with the 32-bore auxiliary tube of his shot-gun and number 12 shot—an unheard-of feat. It was, however, not always necessary to go into the forest to hunt; the open plot in which the settlement lay attracted many birds, such as tanagers, vermillion flycatchers, swallows, and others, which were never found in the forest; and small mammals in abundance lived in the houses. We frequently caught five species of rats in a single house in one night, and

at least two species of bats lived in the palm-leaf thatch of the roof. Some of the rodents, particularly a large spiny rat, lived under the floor, while others made the walls and ceiling their homes; each species seemed to adhere more or less closely to its own part of the dwelling, thus dividing the houses into well-defined "life zones." The natives are very fond of the flesh of the spiny rat and often begged for any which chanced to come to our traps. Ocelots were not wanting in the neighborhood; they visited the hen-houses occasionally at night, but never entered by the doors, preferring to tear holes in the side of the structures; they killed a large number of fowls, on one occasion nearly twenty on a single visit, prompted apparently by the mere lust for killing.

At night vampire bats came out in hordes; they attacked everything from human beings down; even the few miserable pigs kept by the Indians were severely bitten and kept up a continuous squealing as the bloodthirsty creatures settled on them, usually at the base of the ears, and began their painful operations. The worst sufferers by far, however, were the mules. As soon as the sun set, our peons brought the animals to the corral and strapped canvas covers over them; this precaution, however, was of little avail, for the bats attacked all exposed parts, causing the mules to kick and roll with the result that their covers were soon torn off. We went out frequently to watch these obnoxious creatures at work; after circling above their prospective victim a few times, they dropped suddenly, usually upon the neck or flanks, and at once began to bite and suck, making a grating sound with the teeth all the while. They paid no attention to us, although we stood but a few feet away, but clung with folded wings to their victim, perfectly motionless and in an upright position; if we moved they uttered a few squeaks, but made no attempt to fly until we reached for them and came to within a few inches, when they reluctantly fluttered up but almost immediately settled on the other side of the animal. Desiring specimens of them for our collection, we went one night to the corral armed with a butterfly net and, approaching one of the mules on whose back were a dozen or more bats, made a hurried sweep with the net; as the large, white bag of netting scraped the back of the nervous animal he sank to his knees with a groan of despair, wondering, no doubt, what new monster had swooped down upon him to add fresh suffering to his already unbearable existence. In the morning the mules were in a pathetic condition; blood continued to flow from the wounds made by the bats' sharp teeth, so that the ground was red, and the animals were covered from head to foot. It was always necessary to take them to the river and wash them, and then disinfect the numerous punctures; if this is not done flies attack the sore spots, infesting them with their larvae, and the animals die of blood-poisoning. After three nights we were compelled to start the mules back to Cochabamba, as they were on the verge of exhaustion.

While at Todos Santos we learned of a mission among the Yuracaré

Indians, about twelve miles distant, near the Rio Chimoré. We expressed a desire to visit it, but the *intendente* told us that such a move was impossible. He said that the priest in charge of the mission was absolute monarch of the territory under his control; that he would permit no one to come near his retreat; and that this mandate had never been disobeyed. Such statements made the place seem all the more alluring, and we were eager to go there at almost any cost; we devised many plans which we hoped would lead to an interview with the priest, but all of them failed miserably; finally, however, the opportunity came to us in an unlooked-for manner. A misfortune to one person frequently comes in the guise of a blessing to another, and so it happened in this instance. As we were pursuing our work one afternoon in the open corridor in front of our room, a long canoe drew up at the river bank and a priest, followed by a dozen Indians, stepped ashore and marched across the clearing to the *intendente's* quarters. We immediately recognized him as Padre Fulgencio, the missionary of whose despotic rule we had heard so much; but he did not even glance at us as he passed. While we were debating upon some diplomatic move which might serve as an excuse for an interview—for now or never was the time to obtain the coveted permission—he suddenly emerged from the house and came straight to us. A few curt remarks were exchanged and then he related his trouble. To make a long story short, he was suffering from a severe toothache; it had kept him awake many nights, and at last he was forced to come out of his retreat in search of a remedy. The *intendente* could do nothing for him; could we do anything?

How I thanked my lucky star for a limited knowledge of medicine! After an examination, conducted with much formality, the trouble was pronounced curable. He submitted bravely to the injection of cocaine, and soon after was relieved of the aching member. Tears rolled down his cheeks as he expressed his gratitude, and then, taking note of the work upon which we were engaged, he suddenly asked: "Why don't you come to the mission? I have four hundred Indians who spend several days each week in hunting; they can take you anywhere and also bring you all kinds of animals." We needed no urging, and within five minutes the day was set when porters in abundance would come to convey our equipment, and we should start on our journey to the mysterious stronghold of Padre Fulgencio and the boundless jungles bordering the Rio Chimoré.